



State of Minnesota

Minnesota Health-Related Licensing Boards

Continuation of Operations Plan

2008 NASCIO Recognition Award Nomination

Category 1: Business Continuity and Disaster Planning

Executive Summary

The 17 Minnesota health-related licensing boards (HLBs) were able to achieve their goal of re-establishing critical services within 48 hours through the purposeful development of a shared *Plan for Disaster Recovery and Business Continuation*, which featured virtualization of the IT server environment as an important component.

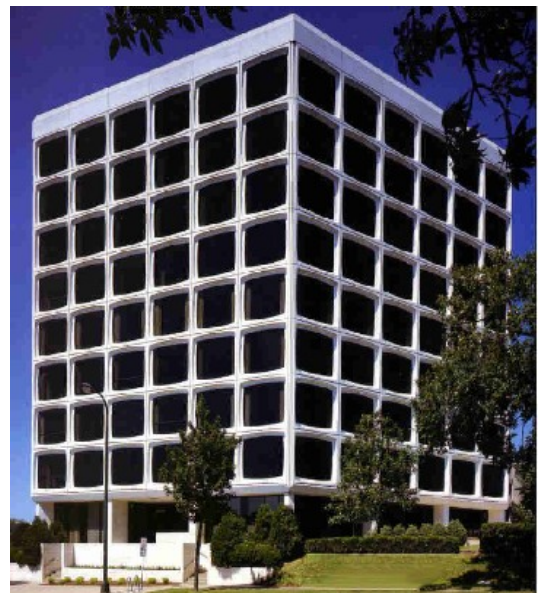
Five million Minnesotans and all Minnesota hospitals and other healthcare facilities depend on the HLBs to protect the public health and safety by providing reasonable assurance that doctors, nurses, veterinarians and other health care providers are competent, ethical practitioners with the necessary knowledge and skill appropriate to their role.

The boards capitalized on their existing working relationship and renewed their commitment to work together to identify and implement optimal solutions. As a result, the HLBs are prepared to provide for public safety and the interests of the people of the State of Minnesota by restoring mission critical services within 48 hours.

The project produced significant beneficial outcomes for disaster preparedness as well as day-to-day operations. A cost savings of \$200,000 was realized by cooperatively developing the plan. A less tangible qualitative outcome, increased cooperation among the IT staff, was also achieved. Electricity and gasoline will be conserved. The new technology will save 400,000 kilowatt hours in a 10-year period. Thus, virtualization of the IT server environment will result in additional saving of more than \$144,000.

The new environment is more secure, integrated, flexible, and more easily managed. Because the architecture is scalable, it is a model for other state agencies, including those much larger than the HLBs.

Finally, the new technology environment has enabled the boards to respond to the Governor's workforce planning mandate with innovative strategies. Recruitment and retention of qualified workers will be enhanced.



Problem Description, Strengths, Barriers and Solution

The 17 Minnesota health-related licensing boards (HLBs) were aware that a natural or biological disaster would compromise their mission-critical licensing function and that rapid recovery would be imperative. They were also cognizant of the lessons learned from the disaster caused by Hurricane Katrina (e.g., imposters posing as health professionals and loss of critical records) and the preventable delays in the recovery process at another Minnesota state agency which experienced a server crash. However, the majority had not developed a comprehensive plan for recovery. In 2006, Governor Tim Pawlenty issued an *Executive Order Updating State Agency Emergency Planning* mandating that every state agency develop by June 30, 2007, a Continuation of Operations Plan (COOP) and a plan to sustain operations in the event of a Pandemic Flu Outbreak as part of the overall *Emergency Operations Plan for the State of Minnesota*.

Five million Minnesotans, all Minnesota hospitals and other healthcare facilities depend on the HLBs to protect the public health and safety by providing reasonable assurance that doctors, nurses, veterinarians and other health care providers are competent, ethical practitioners with the necessary knowledge and skill appropriate to their role. These gubernatorial mandates were the impetus for the HLBs, which license approximately 234,500 individuals, to re-examine their respective readiness to respond to a disaster and to develop appropriate plans.

Strengths: Individually and collectively, the HLBs have been pioneers in the implementation of online services in Minnesota state government. The boards are located in one building, and have worked cooperatively since 1993 in the areas of accounting, purchasing, human resources, and computer support. Voluntary sharing of technology and financial resources between the various boards has leveraged IT acquisitions and enabled boards to benefit from “leap-frogging” on the advancements made by other boards, e.g., online applications and credit card processing.

Most boards lacked the financial resources to develop a comprehensive disaster recovery plan. However, by sharing costs, the HLBs were able to contract with another state agency, the Office of Enterprise Technology (OET) for specialized expertise to develop the plan. This cooperative effort also permitted the HLBs to leverage the expertise of personnel in various boards and assign teams for each of the areas vital to sustaining or recovering operations in the event of a disaster. For example, the Executive Director (ED) of the Emergency Medical Services Regulatory Board is a member of the Governor’s Emergency Response Team. Another ED has community emergency services response experience and was a natural for the Command Chief position on the Disaster Response Team.

Barriers: Developing a single Continuation of Operations Plan for disaster recovery presented a particular challenge to the HLBs as each is statutorily autonomous and has a separate reporting structure and a unique responsibility to its own licensees. In addition, some of the boards require a more aggressive recovery time than others based on the type of disaster which occurs. Critically, the information technology (IT) environment suffered from the fragmentation caused by personnel turnover and piecemeal implementation of systems without a comprehensive plan over the previous decade.

In early 2007, the IT environment included 16 servers, six different operating systems, 200 laptops and workstations, as well as printers, fax machines and hand-held personal computing devices. Each board's workstation required a unique configuration and desktop application. Each board hosted different applications and databases with varied recovery requirements on the servers. Some of the servers delivering mission-critical services were out of warranty and beyond the limits of technical support, while others had only very short-term warranties remaining. A cumbersome tape backup system, taking more than 14 hours to process the nightly backup, would sometimes terminate unexpectedly. Backups were not accessible during off-hours as they were stored at a bank vault and were not secure due to lack of encryption. The email system was on the verge of failure, and databases necessitated safer methods for maintenance and upgrade to reduce down time and potential data loss in the event of an emergency. In addition, the IT network offered only limited remote access functionality to enable work from home or other remote location.

Finally, the difficulties in reaching a solution were compounded by the requirement to prepare for a situation in which the building was destroyed, but the staff were still available (an aircraft crashing into the building or the building being destroyed by a tornado) or a scenario where up to 60 percent of the staff were sick with the Avian Bird Flu and social distancing would be implemented on a mandatory basis to prevent further spread of this disaster.

Solution: The HLBs adopted a goal of re-establishing mission-critical services within 48 hours through a shared disaster recovery and business continuation plan.

To resolve the critical personnel, facilities and technical issues, the HLBs committed to:

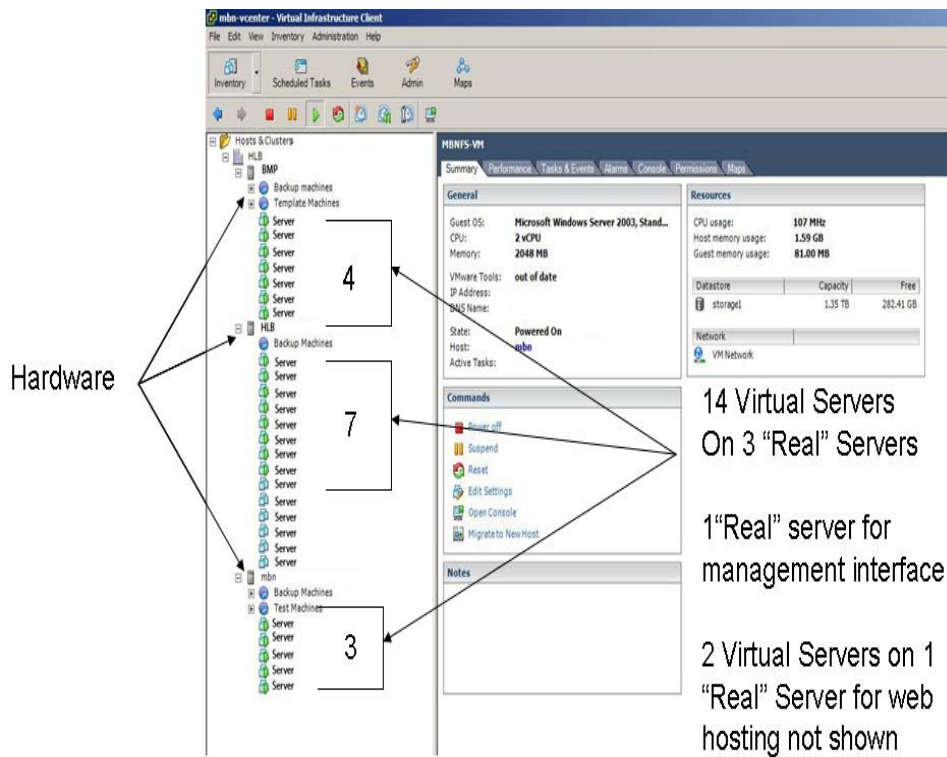
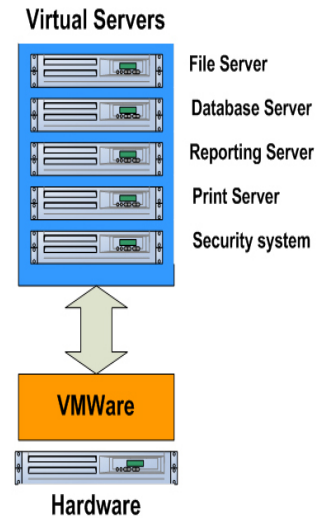
- work together to identify and implement optimal solutions,
- make decisions in the best interest of the people of the State of Minnesota and the customers served, and
- continuously seek out innovative technologies and business practices that improve public sector performance and service levels.

The solution required major critical path analysis, business process re-engineering, re-examination of working relationships, and identification of environmental factors and common values.

Personnel: Once the personnel issues were identified (i.e., minimum staff needed to re-establish essential services, constituencies for each board, and communication strategies), the HLBs developed plans to notify personnel of alternating shifts, alternate work locations, social distancing, phase-in of services as they were restored, call trees; shared use of workstations, and resolution of security issues related to access to confidential files in shared workspaces.

Facilities: The Facilities Team developed strategies to assess damage and environmental hazards following the disaster; created a notification process to communicate to staff regarding alternate work locations or telecommuting; and implemented an interagency agreement with the Minnesota Department of Health (MDH) and the OET for temporary office and planning space after the initial recovery period.

Technical: The IT Working Group, previously a loosely organized ad hoc committee, was formalized into a designated technology team and developed a comprehensive plan to restore essential services within the 48-hour window. The core of this plan was a virtual server strategy to replace 16 servers in the existing environment with four servers through the use of virtualization, which allows a single computer to do the work of multiple servers. Each of these virtual servers is isolated from the others and appears to users, as well as to applications on the network, as a separate machine. Each virtual machine consists of files on the host system that can be easily copied, backed up, or moved between systems regardless of the underlying hardware and restored at an alternate location. For recovery of user workstations, the team identified a core workstation configuration and implemented a system of disk “images” which can be rapidly loaded to any available desktop computer with minimal configuration assistance from the IT staff.



The state’s LAN/WAN enterprise (online) backup system was adopted and agreements were established to ensure availability, as well as a redundant tape backup. This system allows rapid access of online backups (without the need to access the bank vault) and provides for enterprise-class, redundant, geographically separated backups that can be quickly recovered to any system on the state’s network. The tape backup provides an extra measure of security in the event that communication lines are not available to access the online backup systems or the online backup is otherwise unavailable. Finally, the technology team adopted the state-recommended encryption software for laptops, flash drives and hand held devices. More than 100 of those devices have been encrypted.

Length of Time in Operation: By contracting with another state agency for the specialized expertise needed to drive the plan, the HLBs avoided the need for a lengthy Request for Proposal process and, despite the challenges inherent in reaching consensus among multiple organizations, the plan was developed in only 12 months, in time to meet the imposed June 30, 2008 deadline for creating a disaster recovery system. In addition, by electing to take a “clean slate” approach, the technology team was able to create a new “virtualization” infrastructure to accommodate the aggressive recovery timelines and also correct other environmental deficiencies at the same time. The virtualization was undertaken during the summer of 2007, and the HLBs have enjoyed the benefits of this stable, integrated, more easily recoverable work environment since October of 2007.

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| Significance of the Project to Improve Government Operations |
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A cost savings of more than \$200,000 resulted from the cooperative agreement to contract with the state disaster planning expert to assist in the development of one plan for all the HLBs. By sharing resources and personnel expertise, the HLBs have developed a more comprehensive plan than if the process had been done separately. Finally, the plan is fully updatable. As personnel change or additional threats emerge, these changes can be easily added to the plan.

Under the virtualization strategy, the HLBs spent \$68,370 to replace 16 servers with four, resulting in savings of 46 percent, or \$57,854. In 10 years, virtualization will result in additional saving of more than \$144,000 for the HLBs, based on a four-year replacement plan.

| Cost to Replace 16 Servers | | | | | |
|-----------------------------------|-----------------|--------------|-----------------|---------------------|------------|
| | Quantity | Price | Total | Cost Savings | |
| Internal Servers | 3 | \$17,357 | \$52,071 | \$58,375 | 53% |
| Web Servers | 1 | \$16,299 | \$16,299 | -\$521 | -3% |
| Totals | 4 | | \$68,370 | \$57,854 | 46% |

The virtual server strategy has also resulted in comprehensive improvements that support day-to-day activities of the boards. The new environment makes it possible for staff of one board to restore services for another board, without complete in-depth technical knowledge of all the board’s applications. Back-ups are accomplished more quickly and, in the event of a major server crash, a server can be completely restored almost immediately. Finally, disk imaging of user workstations and the implementation of “roaming profiles” and a common login system allow staff to log in to any available workstation. Although IT staffs are employed by separate boards, they function as one team in response to a disaster.

The security policy for the HLBs has been upgraded. All laptops, flash drives, and handheld devices now use encryption technology. The security policy also addresses the need for firewalls and malware detection on all home computers used for remote access to the HLB network. Because of the renewed emphasis on security, the HLB network is now better able to support paperless meetings, and an environment has been created which will enable secure document viewing in the future.

The upgraded IT environment has increased “remote access” capability so that a nearly unlimited number of staff could now work from home if “social distancing” were implemented. This

capability also gives the boards the increased opportunity to implement alternative work strategies such as telecommuting and flexibility in scheduling. Such implementation will result in enhanced recruitment and retention of qualified workers, reduced utilization of physical resources, such as space, and conservation of electricity and gasoline. Pursuant to another Governor’s directive, the boards are currently engaged in workforce planning to address the composition of the current workforce and the availability of future workers. This new environment provides additional options for planning the “Workforce of Tomorrow.”

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| Public Value of the Project |
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The new environment supports the state’s effort to “Go Green.” The reduction of servers has resulted in a three-degree temperature drop in the server room. This reduction will extend the physical life of the machines and result in cost saving for the air conditioning units. The electrical power requirements for the server room have dropped by 40,471 kilowatt hours per year or 400,000 kilowatt hours in a 10 year period.

Energy Savings: 16 servers vs 4 Servers with Virtualization

| | Quantity | Watts/Server | Total | Annual Savings | |
|------------------------------|-----------------|---------------------|--------------|-----------------------|---------|
| Power for planning | 4 | 500 | 2,000 | 52,560 KWh | \$1,924 |
| Actual from Third Party Test | 4 | 385 | 1,540 | 40,471 KWh | \$1,481 |

The virtualization strategy has received national recognition in a featured presentation at a national nursing regulation forum in Chicago in May of 2008. Also, the HLB plan has become a state model and is used by OET for training other Minnesota state agencies. Because the architecture is scalable, it is a model for other state agencies.

This project demonstrated that cooperative efforts of state agencies can result in standardization, cost savings and better services.

The HLBs are now prepared to respond quickly should a pandemic flu outbreak require the health-related licensing boards to verify credentials to hospitals as medical personnel are mobilized to designated crisis medical facilities, or if additional licensees need to be quickly credentialed as part of the state’s disaster response effort.

The ultimate result is that the health-related licensing boards are prepared to better provide for public safety and the interests of the people of the state of Minnesota.